TABLE NO | | |

MULTIMEDIA UNIVERSITY

STUDENT ID | | | | | | | | | |

SUBJECT CODE _____

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2015/2016

TSE3351/TSE3571 – SOFTWARE EVOLUTION AND MAINTENANCE

(All sections / Groups)

10 MARCH 2016
2:30 p.m. – 4:30 p.m.
(2 Hours)

Question	Mark
1	
2	
3	
4	
Total	

Examiner 1 Signature: _____

Examiner 2 Signature: _____

Examiner 3 Signature: _____

INSTRUCTIONS TO STUDENT

1. This Question paper consists of 9 printed pages (including cover page) with 4 Questions only.

2. Attempt **ALL FOUR** questions. All questions carry equal marks (15 marks). The distribution of the marks for each question is given.

3. Please write all your answers **CLEARLY** in the specific answer box provided for each question. Submit this question paper at the end of the examination.

Attempt all FOUR questions.

QUESTION 1 [2 + 2 + 4 + 4 + 3 marks]

NetCode system needs to feed streaming content from the Amazon resources. NetCode and its customers are one of the heaviest users of the Southeast Asia Internet, by some estimates accounting for over one-third of all traffic during peak movie-watching hours. Its movie-streaming business has been the source of technological innovations as it has innovated to meet consumers' ever-rising standards.

Based on the above scenario, answer the following questions Q1 (a) to Q1 (d):

a) What are the TWO characteristics of Code-and-Fix model if the above NetCode system would to apply this Code-and-Fix model? **[2]**

b) Draw a diagram and describe the phases in this Code-and-Fix model. **[2]**

Continued...

c) Explain TWO weaknesses of Code-and-Fix Model applied to the above system. **[4]**

d) Despite the weaknesses, why then consider Code-and-Fix Model for the above system? Explain your answer. **[4]**

e) Give THREE reasons why it is important to categorize the above NetCode system during maintenance. **[3]**

Continued...

QUESTION 2 [6 + 5 + 2 + 2 marks]

BuntStar is a company focusing on software engineering. BuntStar offers a range of applications mainly for utilities, and it develops custom applications using agile practices. To achieve the required service level, BuntStar uses reserved instances and a second redundant region in Australia. It also self-monitors its cloud resources and has set alerts for failures. This approach lets the company achieves its desired reliability and availability.

In a public cloud, a provider provides the infrastructure to any customer. A private cloud is offered only to one organization. In a hybrid cloud, a company uses a combination of public and private clouds.

BuntStar's experience with the public cloud has been positive from economical and technical viewpoints. Using a public cloud has allowed BuntStar to simplify processes and minimize the need to support a big hardware infrastructure and a high bandwidth in its installations. As a result, the company is promoting this architecture in its customer projects, using the public cloud for load tests and production environments.

a) You are appointed as the software maintainer of BuntStar applications. Discuss any SIX issues that can contribute to high maintenance costs. What steps would you take to minimize the effects of high maintenance costs? **[6]**

Continued...

b) Referring to your solution in Q2 (a), what are the FIVE factors that can affect the maintenance personnel to acquire the necessary knowledge for maintaining the abovementioned system? **[5]**

c) Explain the following software product attributes of decision-support:
   i. Complexity **[1]**
   ii. Maintainability **[1]**

d) Describe how would the software product attributes in Question 2 (c) help to guide maintenance personnel. **[2]**

Continued...

QUESTION 3 [6 + 2 + 3 + 4 marks]

A modernization project usually has three phases. First, reverse engineering provides an understanding of the purpose and current state of the system. Many supporting approaches rely on model-based techniques to discover software models representing the system at a higher abstraction level. Examples of such models are UML (Unified Modeling Language) class diagrams, state machines, and workflows. Second, forward engineering analyzes those models and transforms them (if necessary) to become the modernized system's specification. Finally, developers or automated code generation techniques (or a combination of both) use these models to produce the corresponding code for the targeted platform.

a) List SIX objectives of reverse engineering as in the above first phase. **[6]**

b) Define how does forward engineering differ from reverse engineering? **[2]**

Continued...

c) Explain THREE benefits that the achievements of the reverse engineering can bring for the above scenario. [3]

d) List at least EIGHT benefits that can be derived from software reuse. [4]

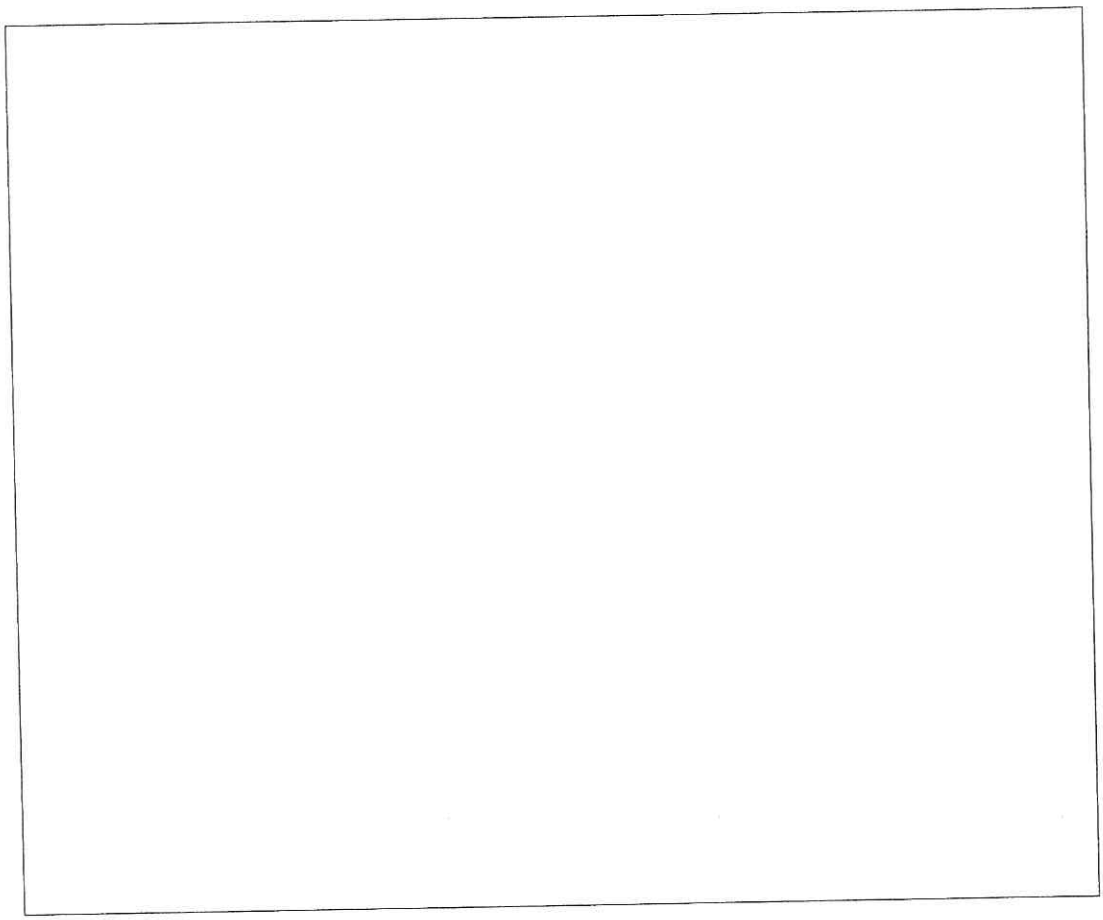
Continued...

QUESTION 4 [6 + 6 + 3 marks]

Many remote collaboration platforms are currently available and in use by software engineers, such as Dropbox for file sharing, Basecamp for project management, Google Docs for collaborative document sharing and editing, and WebEx for screen sharing. However, the nature of software engineering often requires more specialized systems, such as the Git platform, which is designed for managing changes to source code and documentation.

Originally developed for managing the source code of Linux, Git has found broader use, often in conjunction with other tools. For example, one can make mobile-commerce hardware modules for vending machines, games, and other devices to do private Git repositories for hardware files like schematics, and board layouts. In short, this Git evolution helps remote-collaboration for software engineers.

a) Explain the THREE characteristics that a measurement procedure must demonstrate for measuring the Git system. **[6]**



Continued...

b) Describe the THREE software maintenance-related entities whose attributes can be subjected to measurement on the Git system. **[6]**

c) Explain TWO measures of process quality that can be applied to the Git system. **[3]**

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